

MPAs: AN OVERVIEW

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Acknowledgements

The majority of information presented in this module is drawn from the following publications:

Francis, J., Johnstone, R., van't Hof, T., van Zwol, C. and Sadacharan, D. (Editors). *Training for the Sustainable Management of Marine Protected Areas: A Training Manual for MPA Managers*. CZMC/ WIOMSA. 267p.

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OVERVIEW

Marine Protected Areas (MPAs) are essential to biodiversity conservation and the maintenance of ecosystem health and services. MPAs can exist individually or in a network. MPAs are complementary management tools to an Integrated Coastal Management program.

There are thousands of MPAs located around the world that are established by local communities and governments or by national agencies. MPAs range in size from 5-10 hectares all the way up to 35 million hectares, although most MPAs are on the smaller end of this scale. There is no one 'right' model for a MPA, although all generally share objectives for conservation of biodiversity and many MPA programs rely on stakeholder involvement in the management process.

Despite the many MPAs already functioning, the percentage of coastal and marine areas contained in protected areas is relatively small. There is also still a great deal to learn about designing, planning and managing MPAs. Any chance for those involved in MPA management to come together and share knowledge and practical experiences is a valuable opportunity.

IMPORTANCE OF EFFECTIVE MPA MANAGEMENT

Effective marine protected area management is needed for a MPA to be successful in meeting its objectives. Management of a MPA begins with the idea for it and continues through the planning and designation process to the day-to-day operation of the MPA. Effective MPA management relates to other coastal and marine management processes and principles, including, but not limited to community-based participatory processes, law enforcement, poverty reduction, creation of alternative livelihoods, sustainable tourism, institutional capacity, education, outreach and awareness-building.

LEARNING OBJECTIVES

- ✓ To welcome and introduce course participants and cover the workshop objectives and workshop format
- ✓ To provide an understanding of the scope of the concept of marine protected areas (MPAs) and their relevance to the management of coastal and marine environments
- ✓ To introduce coastal management techniques that are compatible with MPAs

LINKS TO OTHER EFFECTIVE MANAGEMENT AREAS

Community-based Participatory Processes

It is often the case that a MPA will be more effectively implemented when the planning process as well as general management involves the surrounding community.

Management Planning Process

An effective MPA requires thoughtful planning before, during and after the establishment of the MPA.

Coastal Law Enforcement

A comprehensive and effective coastal law enforcement program is necessary for the MPA to meet its goals and objectives.

Alternative Livelihoods and Poverty Reduction

A successful MPA can contribute to sustainable tourism, which creates alternative livelihoods. In addition, effective MPA management can lead to improved coastal resources including increases in fishery resources.

Sustainable Tourism

An effectively managed MPA can attract visitors from the home country as well as tourists from around the world. Managing tourism to be sustainable within a MPA can be a source of revenue.

Fisheries Management

Many MPAs have contributed to an increase in fish biomass in waters surrounding the MPA, which can lead to more sustainable fisheries.

Awareness-Building

Establishing and effectively managing MPAs builds awareness among the local public and visiting tourists for why a healthy coastal and marine environment is important.

Marine Conservation

Effective management in a MPA can lead to conservation of biodiversity and the protection of ecosystem health.

LESSON PLAN

.1 WELCOME TO THE WORKSHOP

Exercise 1.1 — Introductions and Discussion

Introduce yourself to your neighbor (if you have not done so already) and conduct a short ‘interview’ so that you can introduce them to the group.

Some question suggestions:

- *What is your name and position?*
- *What is a feature (physical or management) of your MPA of which you are proud?*
- *What do you hope to bring home from this training?*
- *What is your favorite marine species and why?*

Site Overviews of MPAs Represented

The MPA sites represented at this workshop will be introduced.

*Handout: **Manuals***

Overview of Training Program

- Overview of purpose and need for management capacity training
- Structure of training program
- Expectations, proposed outcomes
- Review course content
- Follow-up program
- Review contract agreements

Discussion— Ground Rules

Work in groups to establish ground rules of the workshop; example ground rules might include all listening while one person speaks, having an open mind, etc.

1.2 INTRODUCTION TO MARINE PROTECTED AREAS

A Marine Protected Area (MPA) is defined by The World Conservation Union (IUCN) as:

Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.

Biodiversity and Ecosystem Health: The Purpose and Need for MPAs

Biodiversity is a faster way of saying biological diversity, a term that refers to the variability among and between living organisms and the ecosystems of which they are a part. Biodiversity means there is a variety among organisms from the gene to the species level, and variety among the habitats and ecosystems in which they live. Biodiversity also means that there is a variety in the ecological processes that support organisms.

Biodiversity is the existence of many and various species in a particular area, and although there is a greater number of species on land than in the ocean, there is a high level of variety in the kind of species within higher taxonomic levels (e.g. classes and phyla) in the ocean ecosystem. There are only about 250,000 known marine species and about 1.5 million terrestrial species. However, of the approximately 33 animal phyla or subphyla, at least 32 occur in the sea and about 15 of these are exclusively marine (Norse 1993).

Handout 1.1: Biodiversity Glossary

Species live in habitats. A habitat can be an ecosystem in and of itself, or habitats link together by shared ecological processes to create ecosystems. Biodiversity is necessary for ecosystem functions, ecosystem or ecological integrity, ecosystem health, and ecosystem services.

- **Ecosystem functions** are the ecological processes that are carried out within or between ecosystems. Examples include nutrient retention, nutrient exchange, productivity, succession and decomposition.
- **Ecosystem or ecological integrity** is the ability of an ecosystem to house and maintain a living community over the long-term, maintaining the species composition and the ecosystem functions that belong in that ecosystem.
- **Ecosystem health** means the stability of an ecosystem, its resiliency to stress, and its ability to provide a particular set of services.
- **Ecosystem services** is a term that refers to what an ecosystem can offer humans. Examples of ecosystem services include food, water, shore protection, regulation of climate and contribution to cultural values.

Ecosystem health depends in part on biodiversity. Conserving biodiversity is one way of preserving ecosystem health, which in turn maintains ecosystem services. Conversely, a decline in biodiversity can mean a decline in ecosystem health, which ultimately impacts people as ecosystem services are negatively impacted.

Yet this is just the case in many places around the world. National, regional and global assessments show that biodiversity on land and in the sea is declining, often dramatically.

Effectively implemented protected areas, such as MPAs that aim to conserve whole habitats and/or ecosystems, can ultimately be more effective in preserving ecosystem health than programs or strategies to protect individual target species. MPAs are one way to try to slow loss of biodiversity and protect ecosystem health.

Discussion- Reasons for MPA Designation

What is/are the primary goals of your MPA? Was this used as the basis for determining the location and size of your MPA? Are your management efforts structured around this goal?

Definitions of MPAs

The World Conservation Union (IUCN) definition above is internationally accepted and probably the most widely used general definition for a MPA. It was developed at the 4th World Wilderness Congress and was officially adopted by the IUCN at its 17th General Assembly in 1988, six years afterward the World Congress on National Parks called for incorporation of marine, coastal and freshwater sites into the worldwide network of protected areas (Gubbay 1995, p3).

The IUCN definition of a MPA is also broad; “Marine Protected Area” is a generic term for any marine area protected for the primary objective of biodiversity conservation. It includes protected areas differing in purpose, design, management approach, and name. Therefore any site that fits the definition, whether it is named a reserve, park, or sanctuary, is a MPA. MPAs may also be adjacent to and/or include terrestrial areas. A country may have its own system of naming its MPAs according to defined levels of protection. For example, in the Philippines, there are the following types of MPAs:

Marine Protected Area: any specific marine area that has been reserved by law or any other effective means and is governed by specific rules or guidelines to manage activities and protect part or the entire enclosed coastal and marine environment

- **Marine Sanctuary:** a MPA where all extractive practices, such as fishing, shell collection, seaweed gleaning and collecting of anything else is prohibited. A

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sanctuary can also be used to control other human activities, including access, in order to protect the ecosystem within the specific site.

- **Marine Reserve:** a MPA where the strict sanctuary conditions are not mandated for the entire area yet there is still a desire to control access and activities, such as boating, mooring and various fishing techniques. A reserve allows for zones that include a sanctuary area.
- **Marine Park:** a MPA where multiple uses that emphasize education, recreation and preservation are encouraged. A marine park is usually implemented by zonation schemes that can include reserves and/or sanctuaries.

It is important to note that the levels of protection for a sanctuary in one country could be very different than in another country, and the same goes for reserves and parks!

One more specific definition relevant to MPAs is that of a **Biosphere Reserve**, which is a protected area of representative terrestrial and coastal environments and has been internationally recognized under the UNESCO Man and the Biosphere Programme for their value in conservation and in providing the scientific knowledge, skills and human values to support sustainable development.

Categories of MPAs

There are MPA examples for each of the six categories of protected areas issued by the IUCN through its World Commission on Protected Areas (WCPA). All six categories have equal importance. Countries are responsible for assigning categories for their protected areas, using IUCN guidelines. A protected area is classified as one of the following depending on its primary management objectives and whether they are for:

- I. **Strict protection** (i.e. Wilderness Area)
- II. **Ecosystem conservation and recreation** (i.e. National Park)
- III. **Conservation of natural features** (i.e. Natural Monument)
- IV. **Conservation through active management** (i.e. Habitat/Species Management Area)
- V. **Landscape/ seascape conservation and recreation** (i.e. Protected Seascape); or
- VI. **Sustainable use of natural ecosystems** (i.e. Managed Resource Protected Area)

Additionally, some MPAs can have international status in addition to their national designation. MPAs that are designated as World Heritage Sites or Biosphere Reserves are examples.

Handout 1.2: IUCN Matrix and MPA Examples of Each Category

Objectives of MPAs

The planning and management of a MPA should follow its objectives. At the international level, the **IUCN at its 17th General Assembly in 1988** adopted a set of objectives specific to a global representative system of MPAs:

IUCN OBJECTIVES FOR GLOBAL MPA SYSTEMS

- To protect and manage substantial examples of marine and estuarine systems to ensure their long-term viability and to maintain genetic diversity;
- To protect depleted, threatened, rare or endangered species and populations and, in particular, to preserve habitats considered critical for the survival of such species;
- To protect and manage areas of significance to the life cycles of economically important species;
- To prevent outside activities from detrimentally affecting the marine protected areas;
- To provide for the continued welfare of people affected by the creation of marine protected areas; to preserve, protect, and manage historical and cultural sites and natural aesthetic values of marine and estuarine areas, for present and future generations;
- To facilitate the interpretation of marine and estuarine systems for the purposes of conservation, education and tourism;
- To accommodate with appropriate management regimes a broad spectrum of human activities compatible with the primary goal in marine and estuarine settings;
- To provide for research and training, and for monitoring the environmental effect of human activities, including the direct and indirect effects of development and adjacent land-use practices.

Then in 1992, the **Caracas Action Plan from the IV World Congress on National Parks and Protected Areas** promoted *four overall protected-area objectives*, as well as specified objectives to give attention to the special requirements for managing *marine protected areas*:

IV WORLD CONGRESS ON NATIONAL PARKS AND PROTECTED AREAS:
CARACAS ACTION PLAN

Overall protected-area objectives

- Integrate protected areas into larger planning frameworks
- Expand support for protected areas
- Strengthen the capacity to manage protected areas
- Expand international cooperation in the financing, development and management of protected areas

Objectives for managing marine protected areas

- Contribute to a global system for categorizing coastal marine regions as the basis for assessing the adequacy of protected areas in these regions
- Participate actively in coastal zone management programs and ensure that both marine and terrestrial protected areas are used as key management tools in such programs.
- Develop and implement integrated management programs for marine protected areas

Exercise 1.2— Where Does Your MPA Fit into These Categories?

- Consider the primary objectives for your MPA – *Are they mainly for conservation purposes? Tourism development? Scientific/research?*
- Use the matrix on the handout to determine which of the 6 IUCN categories matches your MPA based on its primary objective.

How to Make a MPA – Guidelines for Site Selection

Four guiding principles to think about for establishing a MPA are as follows (Salm and Price 1995):

1. ***The needs and abilities of the country define the goal and scope of the MPA program.*** It is easy to make long lists of theoretical criteria and objectives, some of which is done below. These are *suggestions* which should be considered along with the needs and abilities of the country and community where the MPA will actually exist.
2. ***The goal of the MPA program is the foundation of the selection process.*** Why do you want to set up a MPA? This is the first question that needs to be asked, for the answer(s) will help determine site selection criteria and management objectives. If the goal is conservation of critical habitats for endangered species, site selection criteria will

focus on ecological processes. If the goal is to replenish fisheries, social and economic factors along with ecological principles will be considered. The process of site selection is the most difficult where MPAs have multiple goals, such as habitat conservation, fisheries enhancement, *and* increased tourism to the area. However, if chosen, planned and implemented well and with all stakeholders' input, these MPAs may have the best chance at being effective in reaching their goals.

3. ***The scope of the MPA program in a certain country will define the site selection process.*** The intended numbers and size of the MPA(s) and whether they are designated at a national, provincial, or local level are important factors. It is difficult to set up a MPA in isolation from their physical surroundings or of the larger coastal management process in place.
4. ***Because each nation has different social, political, economic and environmental parameters, there can be no one definitive model for site selection.*** Past experiences in MPA establishment has resulted in sets of selection criteria that can be adapted to particular situations.

Evaluation of candidate sites relies on data. Data collection, analysis and synthesis are necessary steps to determine whether a candidate site will be selected as a MPA.

Data collection draws from all available sources and should include interviews, field studies and literature searches. Existing data is probably incomplete. A plan for data collection will likely include a series of field surveys to generate baseline social, biological and ecological information.

Data analysis will highlight areas with concentrations of resources and areas with human activities and threats to resources. Analysis can also show where conflicts among activities are possible or already occur. One of the best ways to analyze data is by using map overlays.

Data synthesis is needed to understand the spatial relationships among biological factors (i.e. species), ecological processes (i.e. nutrient transport) and human activities (i.e. fishing). A better understanding of these spatial relationships will occur when map overlays are compared directly and are at the same scale. Data synthesis can also show a picture of which candidate sites or areas may need priority attention.

All these data will more than likely show many places, or candidate sites, that could benefit from MPAs. Site selection criteria are then applied to these candidate sites. A generalized list of site selection criteria follows, but is not meant to be prescriptive! The criteria can and should be adapted to the particulars of the country and culture where the MPA will be.

Handout 1.3: Detailed Site Selection Criteria

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Sites for MPAs may be selected because they fit one or more of the following criteria:

- **Relative naturalness** – areas still in good condition
- **Representativeness** – areas that are unique, include important ecological functions such as spawning, nursery or feeding areas, and/or valuable species
- **Biodiversity** – areas with high diversity of species/ ecosystems; areas with high species' endemism (species that are native to a particular area or region)
- **Vulnerability** – areas with rich resources/ biodiversity that are relatively susceptible to disturbance or destruction
- **Fisheries value** – areas that are strategic for enhancing fisheries; areas of high productivity or are spawning or nursery grounds
- **Tourism value** – areas that could, if protected, enhance appropriate recreational uses and tourism revenues
- **Social acceptance** – acceptability of all stakeholders
- **Practicality of management** – feasibility and level of relative ease of management

***Exercise 1.3 – Panel Discussion on MPA Designation Processes for
GBRMP, FKNMS, and Hon Mun MPAs***

Discussion — Matching Objectives with Site Selection Criteria

How were the site selection criteria for your MPA chosen? Were they based on the objectives of the MPA?

1.3 MPAs AND COASTAL MANAGEMENT

General Management Techniques

There are a range of management techniques that MPA managers can use in a MPA. These techniques can be broadly categorized into ways of prohibiting activity, and ways of limiting activity (Kenchington and Kelleher 1995).

Prohibition

Absolute prohibition of access to a prescribed area is the simplest form of regulation. It is a form of control that establishes a clear yes/no basis – if a person is found in the area, they have violated the regulation.

Prohibition of certain activities within a prescribed area is another prohibitive technique. For example, if fishing is prohibited in a specific area and a person is caught fishing there, they are in violation.

Limitations

Both terrestrial and marine protected areas around the world often allow some level of human activity, especially if it involves recreation, nature appreciation, or research. The management challenge is to design and enforce measures that limit allowed human activities to levels that do not cause harmful or unacceptable impacts. Limitations are also more challenging than prohibitions – they are more complex for area users to understand and may be more difficult for managers to enforce. However, limiting rather than prohibiting activities in an area is usually more acceptable to area users and may be more easily implemented.

Limitation by spatial control involves regulating activities specifically to a part or parts of the MPA. Zonal management is a common way to use spatial control. The management plan will either state permitted uses including where they can occur, or will specify which activities are not permitted and where.

Limitation by temporal control is used when management can change over time. Closed seasons are one way of temporal control, and a 'season' can be as short as one day or be declared for weeks, months, or years.

Limitation by equipment restriction is a way of regulating the use of equipment or technology that is efficient for its purpose in the short term but damaging to resources in the long term. Good examples are fishing gear restrictions (i.e. no trawls in an area) or restrictions on the use of anchors or high speeds by boats.

Limitation by quotas is most commonly applied towards fishing, whether recreational or commercial. A fishing quota sets a limit on the allowable harvest with the goal of leaving enough of the resource to replenish itself. Quotas can also be used in management in the form of setting a carrying capacity for MPA users. Whether they limit how many fish can be taken out of the MPA or limit how many tourists can be put in, quota systems vary widely and really depend on the context of a particular MPA.

Limitation by license or permit is a way for management authorities to issue permission, through official documentation, for a person or people to engage in specific activities in the MPA. Licenses and/or permits can be issued based on skill, resource allocation, or other characteristics.

Most management systems for MPAs will use a variety of management approaches to achieve the MPA objectives.

Discussion—Management Techniques

Think about the management approaches currently used in your MPA – *are they more limited or prohibitive? Which techniques are the easiest/ least controversial to implement? Which are the most effective?*

Integrated Coastal Management (ICM)

Discussion— Experiences with ICM

Is ICM a framework for coastal management in your country or local government?

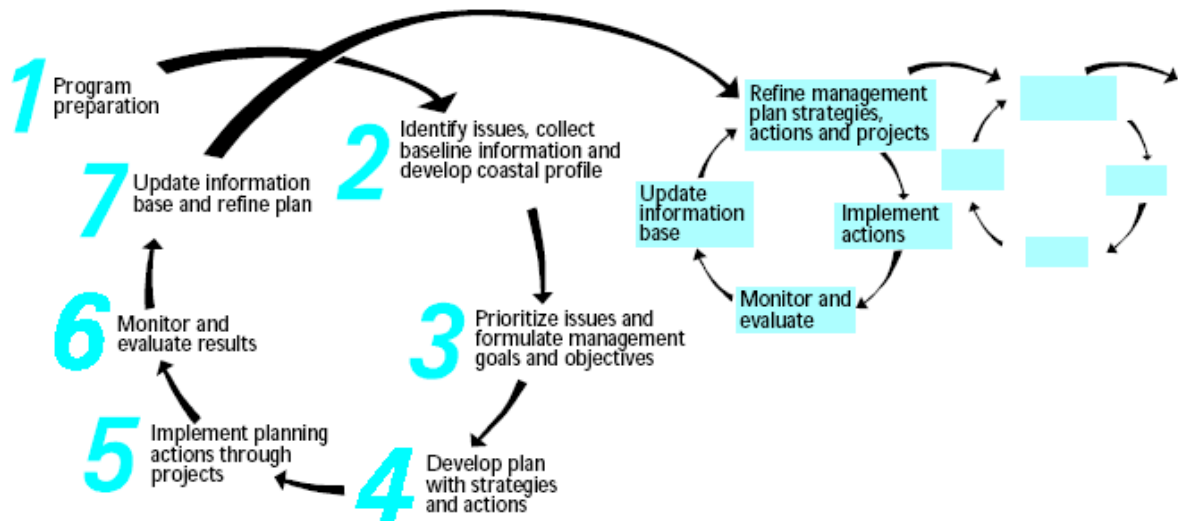
A goal of coastal management is to improve the quality of life of human communities which depend on coastal resources, while maintaining the biological diversity and productivity of coastal ecosystems. Coastal resource management (CRM) is the participatory process of planning, implementing and monitoring sustainable uses of coastal resources using collective action and sound decision-making.

Integrated coastal management is a process for coastal resource management. It stresses the *integration* within government, the community, academe, and sectoral and public interests in preparing and implementing a thorough plan for the protection and development of coastal ecosystems and resources.

To *integrate* means to make whole by bringing all parts together; to join with something else; to make part of a larger unit; to unify or unite. ICM stresses the need for:

- Integration across ecosystems that do not stop at the water's edge;
- Integration across academic institutions, beyond any one academic discipline;
- Integration across levels of government and their respective agencies; and
- Integration across policies especially where overlapping laws, plans and programs already exist.

Integrated coastal management aims to bridge divides among local government, national agencies, community groups and non-governmental organizations. ICM also aims to improve and integrate the administrative, policy and regulatory processes that shape and affect coastal management.



Cyclical ICM data collection, planning, implementation, and monitoring process (White 1997).

Especially important in ICM is the need for **collaborative management or co-management**, where all resource stakeholders participate in management. Successful coastal resource management and ICM often rely on the following key elements of co-management:

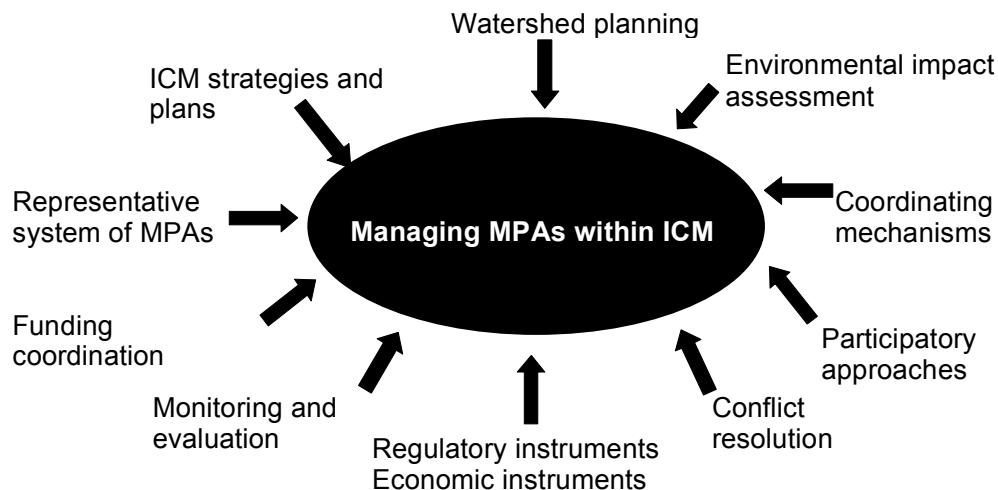
- All stakeholders have a say in the management of the resource on which they depend
- Sharing of management responsibility, according to the specific division of authority between local community organizations and levels of government – although in most cases government assumes responsibility for the overall policy and coordination functions
- Social, cultural and economic objectives are an integral part of the management framework

ICM programs are generally centered on coordinating bodies or committees that have members and representatives from all the sectors and stakeholders. Regular meetings should be held so that information can be exchanged and group action can be taken on issues facing the coastal zone. MPA managers or other representatives of MPAs should participate in these meetings. In this way ICM can be used to address activities that may have a negative impact on the MPA, but over which the MPA management has no control. Examples of these activities may include pollution, agricultural run-off, port development, or watershed and river basin development.

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ICM and MPAs

Integrated coastal management is a management framework, while a MPA is a discrete area to be managed. However, a MPA can be affected by activities taking place outside its boundaries, and an effective MPA will create benefits for the larger coastal zone. There are strong connections between MPAs and nearby land and water that exist in currents, migratory species, larval dispersal, nutrient exchange and other processes. MPAs need to be incorporated into the overall coastal management regime for the country. ICM provides a framework for coastal management with MPAs being essential components within ICM for protecting biodiversity and ecosystem health.



Tools to manage MPAs in the context of ICM

Where ICM programs already exist, MPAs need to become a 'stakeholder' – MPA managers can coordinate with management activities outside MPA boundaries, as well as development programs happening in the region. Some larger multiple-use MPAs are themselves similar to ICM programs – they allow for different uses of marine and coastal resources as well as involvement of many stakeholders in the management process. These MPAs might be a catalyst to create an ICM program for the larger coastal and upland areas that surround their boundaries.

CASE STUDY: ICM and Fisheries Management in Vietnam

Handout 1.4: Voluntary MPAs

1.4 MPA NETWORKS

Why Networks?

MPAs are generally more effectively managed and successful when they are implemented within the larger context of coastal management through an ICM process. Logically, 'MPA networks' can do more for biodiversity conservation and fisheries enhancement than individual MPAs. A MPA network is two or more MPAs that complement each other, chosen to achieve either:

Biodiversity conservation – a group of MPAs selected on the basis of geographic distribution of plants and animals and habitat representation, as well as the presence of species or populations of special interest (e.g. threatened and vulnerable species), or

Biodiversity conservation and fisheries enhancement – a group of MPAs selected on the basis of:

- Size of reserves necessary to protect viable habitats
- Presence of target (exploitable) species
- Vulnerable life stages of selected species
- Connectivity among reserves and links among ecosystems
- Provision of ecosystem services to people

Attributes of MPA Networks

Ecological Links

MPAs in a network connect and interact through ecological linkages, which include:

- Adjacent or continuous habitats (coral reefs and seagrass beds)
- Regular larval dispersal in water column between and within MPAs
- Regular settlement of larvae from MPA to inside another MPA
- Movements of adult marine life in their home range from one site to another dependent on habitats or because of regular or random spillover effects from MPAs

A network refers to **social aspects** (communication and coordination between stakeholders in administration and planning) and **ecological aspects** (natural connections between and within individual sites that enhance the ecological function of and benefits to each). Both are important in networking MPAs.

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Advantages of a MPA network

Advantages of a MPA network over individual or randomly-placed MPAs include:

Ecological

- Ensuring that the most valuable marine habitats are at least partially protected
- Ensuring that threatened, vulnerable or overexploited species of a given area will have adequate habitat space in order to continue reproducing
- Ensuring that some of the larvae spilled over from one MPA can settle within its dispersal range
- Enhancing fisheries production for a given management area because the larval production and dispersal and fish spillover effects are maximized through planning

Social

- Building capacity in MPA management across individual MPA management bodies
- Creating a shared information base for all of the MPAs in an area or network that helps in making management choices
- Provides a logical reason for individual MPA managers and stakeholders to coordinate with each other to share experiences
- Possibility of financial and administrative partnering between individual MPA management bodies and other institutions and sectors within a network

Functional MPA networks

A MPA network will have both social and ecological dimensions that can be intertwined in the practical establishment of a functional network. The following is a list of criteria for a functional MPA network:

1. Individual MPAs should each have a certain minimum level of effective management.
2. The first step in planning an area-wide MPA network requires an analysis of critical habitats, fisheries, oceanography and existing MPAs, before looking to new potential MPA sites.
3. 5-10% of critical habitat for a given planning area should be included within a MPA.
4. MPA management bodies need the capacity to link with other MPA management bodies in the area as well as local governments and other assisting organizations.
5. A MPA network should be within the context of ICM plans in the area.

The global approach

The recommended global approach for countries to follow in establishing MPAs calls for:

- A core network of fully protected MPAs or no-take zones that protect critical biodiversity areas
- A larger network of multiple-use MPAs that allow for some human activities within them but maintain vital ecosystem functions and processes
- An overall national MPA system embedded within a national ICM program

Discussion— Experiences with ICM and MPA networks

*Are your MPAs included as 'stakeholders' in larger coastal management regimes?
Are MPA networks being talked about or implemented in your country context?*

***CASE STUDY: Moving From Individual MPAs to Networks of MPAs in the
Philippines***